Learning via Mooc: Feedback From the Moroccan Experience

HANTEM Aziz, ENCG Dakhla, Ibn Zohr University, AIT KASSI Mustapha, FSJES-Ain Chock, Hassan II University, AIT ELMOUMEN Tarik, FSJES-Souissi, Mohammed V University

Abstract - In recent years, the Moroccan education system has suffered from shortcomings linked mainly to structural problems and the lack of an integrated vision. Higher education is not exempt from this situation. The situation is very worrying in educational establishments, particularly those with open access, which house almost 80% of the students (large number of students, lack of guidance, lack of resources, low staffing levels, etc.).

Faced with these observations, it was necessary to look for innovative alternatives that would allow for efficient and democratic education, encompassing quality, reliability, free access and accessibility to all social strata. This solution resulted in the design and production, in collaboration with the e-Learning Center of Mohammed V University in Rabat, between November 2013 and September 2014, of a Massive Open Online Course (MOOC) aimed at the general public. These were the MOOC Accounting, General Fundamentals (3 editions), MOOC Accounting for Current Operations (one edition) and a SPOC (Small Private Online Course) for students of the Mohammed V University of Rabat. The aim of this paper is to present our experience in this area.

KEY WORDS: MOOC, SPOC, E-learning, collaborative work, democratisation of education

I. INTRODUCTION

According to the National Evaluation Unit (INE) of the Higher Council for Education, Training and Scientific Research (CSEFRS), only 32.7% of students managed to obtain their bachelor's degree in the normal time (3 years) or more. This situation has gradually deteriorated to 27.6% in 2012, while 54% of the class dropped out. The higher education system operates at two speeds with huge differences.

This is due to the continuous evolution of the number of students arriving at open access institutions. And misdirection. This exponential increase in the number of students has not been accompanied by the same increase in infrastructure and equipment, or in the recruitment of human resources, particularly teachers. The result is a low student-teacher ratio.

Added to this is the problem of limited infrastructure and equipment. In addition, the budget allocated to the sector remains far from expectations, with almost 60% of it devoted to staff salaries.

The distance education, like all other technical–social developments, is historically constituted in the thinking and behavioural patterns of those who developed, tested, and implemented what were once novel systems [1]. The MOOC, Massive Open Online Course, is an innovative pedagogy, has a start and an end date, these courses include educational resources (videos, ppt, pdf, word,...), a discussion forum with threads favouring interaction, activities (personal or group work), automatically corrected quizzes as well as exams for possible certification.

First, we will deal with the generalities about e-learning and the MOOC in particular. Then, we will present the conceptual framework of the MOOC General Accounting, the fundamentals. Finally, we will present our feedback and analysis of the MOOC-CGF and MOOC-COC

II. DISTANCE LEARNING: DEFINITIONS AND HISTORICAL OVERVIEW

In this section we will present some definitions of distance education, as well as an overview on its history.

A. Definitions

Distance learning or distance education is defined as a mode of education, provided by an institution, which does not involve the physical presence of the teacher (trainer) and students. According to the Association Française de Normalisation (AFNOR), distance learning is defined as a mode of distance learning "designed to enable individuals to learn without travelling to the training site and without the physical presence of a trainer. Distance learning [...] is included in the more general concept of open and distance learning".

Daniel Peraya considers that "Distance learning, because it dissociates the teaching/learning process in time and space, appears from the outset as deferred training and, consequently, it must necessarily be conceived and implemented as mediated training"[2]. In our opinion, distance learning is considered as a device composed of a set of material, technical, human and pedagogical resources set up to provide and ensure learning to individuals who are distant.

B. Historical overview

Nipper [3] (quoted by Peraya, 2005) proposes three chronological landmarks in the history of distance learning:

Printed matter marked the beginning of distance learning and formed the basis of correspondence courses. From the 1960s onwards, the multimedia era began, characterised by the use of different media (print, radio, television, video) which complemented each other and were coordinated with a common educational objective. In the United States of America, educational broadcasts have been used since the first half of the 20th century, but they only became a regular component of distance education courses from 1970 onwards, when cable TV and cable television became widespread [4].

At the end of the 1980s, advances in micro computing and telecommunications enabled distance education to undergo a new transformation. Two new forms of technology emerged: multimedia and telecommunications. The development of telecommunications allows the learner to interact with the teacher and other learners by videoconference, by e-mail, via forums, to exploit the educational resources of the web, to assess himself online...

In recent years, the increasing use of digital technologies in face-to-face and distance learning has led to the emergence of a variety of pedagogical models or types of courses and even training.

It has to be said that training that is entirely or partially distance learning takes various forms and names, so that it is sometimes difficult to know what it is. Indeed, the distinctions between different modes of training are not always clear, distance training and online training are often equated with each other, although there are still training courses that are mainly based on paper media, and the supposed differences between online, hybrid and bimodal training, etc. are not always similar [5].

The contemporary era is marked by the development of telecommunications, networks and platforms for distance learning and the virtual campus. This virtual space is defined by Daniel Peraya (2003) as "a unique environment integrating different functions of information, communication (synchronous or asynchronous), collaboration, management and learning".

C. Typology of courses

The work of Frank Mayadas et al [6] has made it possible to propose a typology of different types of courses. The classification of courses is based on a scale of integration of e-learning that starts from face-to-face courses without technology to so-called 'flexible' courses. We distinguish eight types of course [7]:

Classroom or face-to-face: courses offered in a classroom, in different formats (lecture, workshop, laboratory, etc.) which may use ICT for simulations, or production using computer tools.

Augmented face-to-face: courses which are offered face-to-face, but in which students may be invited to participate in online learning or assessment activities through a platform or website.

Classroom with online extension: courses offered face-to-face, but accessible online through a video conferencing system.

Hybrid: courses in which a significant number of face-to-face sessions are replaced by e-learning sessions or activities, either synchronously or asynchronously.

Asynchronous online: courses in which all content and activities are made available to students who choose when to do them and may communicate with a lecturer or peers by sending messages.

Synchronous online: courses in which all content and activities are made available to students who are required to participate in certain teaching or exchanges at times and through technological means provided in the system.

Blended: online courses combining synchronous and asynchronous modalities.

Flexible, comodal or HyFlex: courses in which students can choose between online (synchronous or asynchronous) or face-to-face mode. This choice can be made during the course.

This typology is of interest to distance and e-learning practitioners and researchers as well as to the stakeholders: administrators, teachers and students. However, this typology does not provide an understanding of which types of course are best suited to the needs of institutions and students. Nor does it provide information on the implications of implementing different types of courses.

D. Characteristics of distance learning

Several researchers have tried to identify the characteristics of distance learning. These characteristics, among others, can be summarised as follows [8]:

Accessibility: distance learning is characterised by flexibility, both in space and time. This mode of learning facilitates access to the public by offering teaching and learning

situations that take into account the individual constraints of each learner.

Contextualisation: My M'hammed Drissi [9] state that distance learning allows the individual to learn in his immediate context. It thus maintains direct, immediate and permanent contact with the different components of the environment, facilitating the integration of scientific knowledge with practical knowledge and the transfer of knowledge.

Flexibility: Perriault [10] states that distance learning offers additional degrees of freedom compared to face-to-face learning. In this sense, flexibility refers to the flexibility in the mode of pedagogical organisation allowing the learner to plan in time and space their study activities and their learning pace. Similarly, it can design activities that offer the learner choices in content, methods and interactions and thus take into account individual constraints.

Interaction and collaborative work: the learning process is essentially based on the interaction between the learner and the tutor and the learner and his/her peers.

The course content requires initial understanding and assimilation by the learner who must review and restructure their individual understandings. This is done through interaction with peers (other learners) and the tutor, which enables the learner to develop an understanding that is commonly accepted by the different learners and the tutor. This interaction can also take place in the context of collaborative work, which is based on a learner/learner and learner/tutor exchange during a learning activity, in which each learner is actively involved in the joint resolution of the activity in question.

E. The Massive Open Online Course (MOOC)

A MOOC "is a free, massively accessible online course given by professors, practitioners or researchers to a qualified audience of learners". Learners can interact with the teacher (trainer) or with each other via forums and discussion threads. At the end of their training, or even during it, they are subject to a test of their knowledge, which increasingly leads to the award of a diploma, the value of which is generally certified [11].

The courses are accessible online from any computer, tablet or smartphone in any part of the world, without the need to be physically present or even to be synchronous with the teacher or tutor, provided they have access to the web [12]. Course content and assignments are organised online and therefore made available to learners, not necessarily for free. In some Moocs, the exams are taken online.

In 2008, the first MOOC on "Connectivism and Connective Knowledge" was released, including the video course and a discussion area. It is published by two Canadian teachers Stephen Downes and Georges Siemens. The course was delivered to 25 students at the University of Manitoba and to 2300 other students from the general public [13].

In November 2011, the MOOC boomed when Stanford University offered a free online course on "Artificial Intelligence" by SebastianThrun . This course attracted as many as 160,000 students from 190 countries, while only 10,000 were expected, 23,000 managed to complete the entire course and 364 obtained the maximum grade, including no Stanford student [14]. Since 2012, MOOCs have been booming. This success is largely due to the fact that they are free, very diverse and accessible.

III. THE INTEGRATION OF ICT IN HIGHER EDUCATION IN MOROCCO

In recent years, higher education has undergone a new dynamic aimed at improving the quality of higher education and modernising its practices, in particular through the implementation of mechanisms (emergency programme) that place the learner at the centre of educational action and integrate ICTs into the world of teaching and education, within the framework of the national strategy "Morocco Digital 2013".

In order to improve its performance, quality and productivity, and to harmonise it with international standards and to make it a vector of development, the Moroccan education system has undergone numerous reforms and upgrading programmes [15]:

- The Education Reform (Law 0100), initiated in 2002/2003, consists of the introduction of the LMD system (Bologna Process 1999). The major contribution of this new reform was the reference made to ICT as both an object and a tool for learning and governance for all disciplines and institutions of higher education.
- The Emergence Project of 2005 gave priority to the new professions of information technology and offshoring, by giving universities the possibility of training engineers, previously reserved for the large management training schools.
- The Emergency Programme (2009-2012) aims to increase the intake capacity of universities, improve the quality of training and enhance scientific and technical research. This programme emphasises in-service teacher training, and obliges the university to equip itself with a digital working environment (ENT) and a strategy for integrating educational technologies into the training provided at the university level.

In parallel to these programmes, the Moroccan government has launched several targeted initiatives dedicated to ICT in education:

- The MARWAN (MAROC Wide Area Network) (1998): this is a non-profit national computer network dedicated to education, training and research. In its new version, MARWAN 3 (2009-2012) offers universities access to high-speed Internet (between 2 and 100 Mbps) thanks to its connection with the GEANT network reserved solely for academic traffic.
- Génie Sup (2008) aims to develop the digital culture of all university stakeholders (teachers, students, administrative staff)

and to integrate the use of ICT in teaching, training, research and the governance of higher education institutions.

- The Moroccan Virtual Campus (CVM) (2004), which aims to promote the use of ICT in classroom teaching at university level, is organised at the level of each university into University Resource Centres with human, technological and financial resources to train and support teachers by providing them with the technological tools necessary for the integration of ICT in teaching (platforms, educational software, etc.).

- Maroc Numeric 2013 is a national strategy aimed at positioning Morocco as a regional technological hub and inserting it, through its companies and universities, into the global knowledge economy. At the level of the universities, it consists of supporting them in the equipment and training of teachers.

These initiatives and efforts have made ICT an important, if not primary, component of the Moroccan educational landscape, both as an object and a tool for learning.

IV. Conceptual Framework Of The Mooc General Accounting, Fundamentals

The MOOC "General Accounting, the Fundamentals" is designed within the framework of a development project of the Moroccan university and in collaboration with the AUF (Agence Universitaire de la Francophonie), the IFIC (Institut de la Francophonie pour l'ingénierie de la connaissance et la formation à distance) and the e-Learning Center of the Mohammed V University of Rabat, the pedagogical team. One and a half years (from October 2013 to January 2015) was dedicated to the design, production, piloting, animation and evaluation of this pilot and innovative project insofar as it is the first of its kind at the Mohammed V University of Rabat but also on a national scale.

The MOOC "General accounting, the fundamentals" is hosted on the EDX platform [16] on the servers of the Mohammed V University of Rabat via the link mooc.um5.ac.ma. Organized in 6 weeks, the MOOC "General accounting, the fundamentals" aims at mastering the fundamentals of general accounting through the study of its two main statements (Balance Sheet and Income and Expense Accounts), the understanding of the functioning of accounts and the principle of the double entry, the assimilation of accounting standards as well as the use of accounting supports. Each week consists of an introduction, 2-3 sections and a graded quiz. Each section is a video recording of a few minutes each with PPT. Generally, a series of exercises is offered as well as a forum with discussion threads.

A. SPECIFIC OBJECTIVES

The MOOC "General Accounting Fundamentals" is a project aimed at both the general public and university students. When designing it, a set of objectives was set which can be listed as follows:

1) Managing massification (for universities) and democratising access to knowledge:

- The courses can be accessed free of charge online from any computer, tablet, or smartphone, from any region, at any time of the day. Physical presence is no longer required.
- To facilitate access to knowledge for rural women who are forced to stop their studies because of the lack of proximity to schools or universities. The same applies to people with reduced mobility.

2) Dematerialising teaching materials

The course in video format as well as the activities, additional resources, and quizzes are available on the OpenEDX platform and not on paper.

3) Develop autonomy, initiative and collaborative work

- The teacher becomes a companion and facilitator.
- Discussion forums allow learners to react by asking questions, responding to each other's comments and building their learning on the basis of shared knowledge.

Improving the quality of education:

- The resources are better structured than in face-to-face teaching.
- The learner can view the same resource several times continuously.
- Teacher/learner and learner/learner interaction is much more present.
- Possibility of self-evaluation.

B. CONSTRUCTION PHASES OF THE MOOC-CGF

As shown in the following diagram, the MOOC "General Accounting, Fundamentals" followed the following construction process:

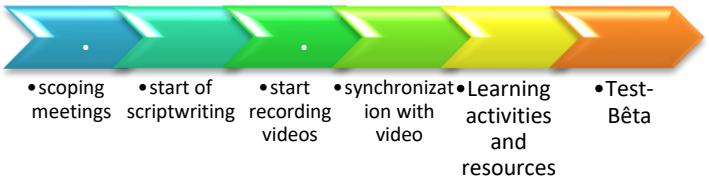

Fig.1. MOOC development process

The **design of** the MOOC is the phase that required the most preparation time, because at this level it is a question of producing course content and scripting it. On the basis of existing content in the form of handouts or PPT presentations, the teacher writes an "outline", a sort of script in Word, which he or she translates into slides. For each slide, the teacher defines the general and specific objectives. The writing of the script obviously takes into consideration the overall objective and also the expectations and questions that the learner might have. At the same time, the teacher reflects on and selects from the resources available online those that would complement the main content. The teacher also develops the activities and

templates to be completed by the learners in Excel format. Once the "flow" in Word format and the PPT (draft) have been finalised, they are sent to the graphic designer.

Then comes the second phase: **production**. This phase first involves the graphic designer who is responsible for the graphic design. The teacher assists the graphic designer in designing the final PPT by matching the script to the content of the slides and ensuring that there are no redundancies. This allows the teacher to make any necessary corrections to the script. This stage takes several hours of work. When the PPT is finalised, it is sent to the audiovisual technician together with the "flow".

The latter, together with the teacher, cuts out the script and translates it into the number of videos to be produced.

Then comes the recording stage in the studio. The finished videos are sent to the engineers of the OPENEDX platform, this is the **deployment** phase. During this phase, the engineers are responsible for integrating the content (main course and resources) into the platform on the basis of the detailed course content plan drawn up by the teacher. In consultation with the teacher, the engineers schedule the start and end dates of the MOOC as well as the dates of the quizzes and activities.

C. STRUCTURE OF THE MOOC-CGF

Hosted on the openedx platform of the Mohammed V University of Rabat, www.mooc.um5.ac.ma, the MOOC-CGF is a course accessible to all regardless of age, gender, nationality, level of study and social class and allows free study via a simple Internet connection. It does not require any prerequisites. The course can be accessed online from any computer, tablet, or smartphone in any part of the world, without the need to be physically present or even to be synchronous with the teacher or tutor, as long as you have the web. With a start and end date, the MOOC - General Accounting Fundamentals - is organised in 6 weeks. Each week consists of two to three sections illustrated by application exercises.

The MOOC provides learners with :

- a teaser
- a video presentation
- teacher-designed and produced educational content in video format of a few minutes each (34 videos) and in PDF format for download;
- activities (in excel and PDF format) with suggested answers recorded in voice-over
- additional resources that can be downloaded as PDF, excel files;
- a discussion forum with threads for teacher-learner and learner-learner interaction;
- a weekly self-assessment in the form of a quiz. At this level, once the appropriate answer has been ticked, the learner can view the explained answer key for most questions.

At the end of the 6 weeks, a digital certificate of successful completion signed by the President of the University is issued to the learner having obtained an average of at least 50%. Since edition 3, a free certificate is offered to learners who have met the following conditions:

- have passed the 6 mandatory quizzes on the OpenEdx platform with an average score of over 75%;
- have submitted the exercise sets to the OpenEdx platform;
- have obtained a mark of at least 10/20 in the final in-person examination.

The assessment of learning outcomes is based on quizzes that are made available to learners at the end of each week. At the end of the 6 weeks, learners will have worked on 6 quizzes.

The questions about the course activities and content formulated by the learners in the discussion forum also allow us to evaluate the learning outcomes.

The University issues a Certificate of Successful Participation signed by the President of Mohammed V University of Rabat for beneficiaries who have completed the programme and validated the learning outcomes.

The University also issues a free certificate to learners who meet the following conditions:

- have passed the 6 mandatory quizzes on the openEdx platform with an average score of over 75%.
- have submitted the exercise sets to the openEdx platform
- have obtained a mark of at least 10/20 in the final in-person examination

D. MONITORING AND EVALUATION

During its implementation, weekly meetings are organised between teachers, tutors, engineers, the audiovisual technician and the graphic designer. During these meetings, the pedagogical and technical assessments of the past week are drawn up on the basis of the reports provided by the platform as well as feedback from some learners. Any problems encountered by learners are listed. We agree on the solutions to be found.

In addition, in the second week, a first questionnaire is launched to determine the level of depth required in the discussion forums. This questionnaire consists of three questions based on possible prerequisites that learners might have, their expectations of the MOOC and the next MOOC they would like to take. A second questionnaire is launched at the end of the 6 weeks in order to take stock of the satisfaction/dissatisfaction of the learners and to make any necessary improvements.

The questionnaire is quite extensive, consisting of 13 questions with the following components:

- general

- technical (ergonomics of the platform, quality of the multimedia content - image, sound -)

- pedagogical (feedback on: pedagogical content, activities, resources, quizzes, achievement of specific objectives per week)

- technical-pedagogical (assistance from tutors/teachers and engineers in case of problems, overall evaluation in relation to the expectations expressed in the first questionnaire)

Once the MOOC is finished, a first analysis of the data provided by the platform is carried out (report on the learners' profile, on the viewing of videos, on the distribution of marks). Finally, once the answers to questionnaire 2 have been received, a debriefing meeting is organised with the team in order to assess the technical and pedagogical aspects of the 6 weeks and to draw up the main technical and pedagogical modifications and enhancements to be made to the new edition of the MOOC.

V. Analysis Of Editions 1, 2 & 3 Of The "General Accounting Fundamentals" Mooc And The "Accounting For Current Operations" Mooc

Since 2016, three editions have been open to the general public: spring edition (May/June) 2016, autumn edition (November/December) 2016 and spring edition (May/June) 2017. At the end of each edition, a satisfaction/dissatisfaction survey is carried out among the learners.

A. *Technical Sheet*

The MOOC General Accounting, Fundamentals is an online course accessible on the openedx platform of the Mohammed V University of Rabat on mooc.um5.ac.ma. It is an xMOOC consisting in the creation and the online publishing of educational content. It aims at mastering the fundamentals of general accounting and identifying the accounting logic. It is spread over 6 weeks. In 2016, we opened it for two sessions. Since 2017, 1 session/year is scheduled. The team is composed of professors, PhD students/tutors and the e-Learning Center team.

B. *MOOC Spring 2016 Edition*

The first edition of the MOOC took place in May/June 2016. Requiring no prerequisites, the MOOC registered 2262 learners with very heterogeneous profiles. The MOOC interested both men and women. 43% of the learners are women and 57% are men from different regions of Morocco. We had some sub-Saharan learners, notably from Benin.

In terms of educational background, as shown in the diagram below, the majority of learners (77%) are university graduates (bachelor's, master's, doctorate), the rest have a very heterogeneous level of education since 5% are secondary school students, 4.6% have a BAC level, 13% are not graduates. The MOOC has therefore enabled people who do not have an advanced level of education to take an interest in and follow the course.

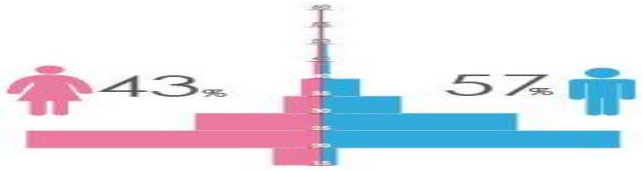

Fig. 2. Age pyramid

More than 70% are between 20 and 30 years old. The over 50s and under 20s represent 6% of the population. This shows that our MOOC has enabled access to knowledge and learning across age, gender, city, country, social and educational levels. Furthermore, at the end of the 6 weeks, 37% had completed the entire MOOC with a success rate of 95%.

Certificates of successful completion signed by the President of the Mohammed V University of Rabat were sent digitally to the persons concerned.

C. *MOOC Autumn 2016 Edition*

The second edition of the MOOC took place in November/December 2016. This edition registered 1839 learners. We noted the same characteristics as the first edition in terms of distribution by gender, level of study and validation rate.

D. *MOOC Spring 2017 Edition, First Free Certification MOOC in Morocco*

The third edition of the MOOC took place in May/June 2017. The main specificity of this edition is the delivery of a free certificate to learners who have fulfilled the following conditions:

- have passed the 6 mandatory quizzes on the OpenEdx platform with an average score of over 75%.
- have submitted the exercise sets to the OpenEdx platform
- have obtained a mark of at least 10/20 in the final in-person examination

This year's edition registered 1,940 learners (almost 10 times more than last year's edition) with, as we have noticed in previous editions, very diverse profiles, including almost as many men as women from the different cities and countryside of Morocco.

The majority of learners are university graduates (bachelor, master, engineers), the rest have a very heterogeneous level of education since 2% are high school students, 18% have a BAC level, 1% have a doctorate, 30% have a baccalaureate +2. The MOOC has therefore enabled people without an advanced level of education to take an interest and follow the course, and "over-educated" learners to follow the same course.

This edition was quite special in that we registered foreign learners and Moroccan residents abroad from 38 different countries from four continents: Africa, Europe, Asia and

America.

It can therefore be said that the MOOC has crossed borders and achieved its initial objectives, including access to knowledge and learning regardless of age, gender, city, country and social and educational levels.

At the end of the 6 weeks, 44% have completed the MOOC in its entirety, 3400 learners have received digital certificates of successful completion signed by the President of Mohammed V University in Rabat and more than 1115 certificates of completion signed by the President have been issued.

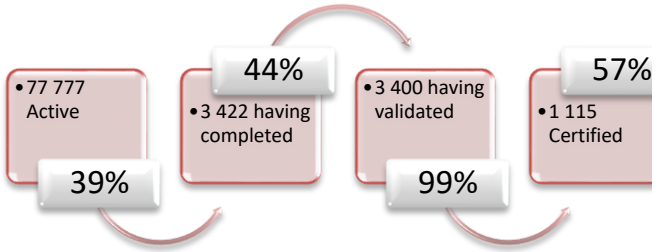

Fig.3. Completion rate and validation rate

E. MOOC Current Operations Accounting :

The MOOC "Accounting for Current Operations" represents a continuation of the MOOC "General Accounting, Fundamentals" and was designed and produced in February/March 2018. This MOOC started on 08 March 2018 and ended on 25 April 2018. It consists of the following elements:

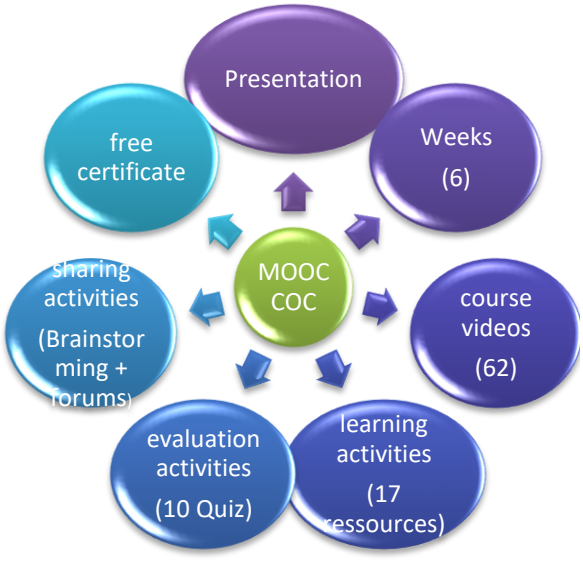

Fig.4. Following elements of MOOC "Accounting for Current Operations"

This MOOC (2018 edition) saw the participation of **29,994 learners from Morocco and 39 other countries** (4 continents), distributed as follows: young people aged 20-30 years constituted 71% of the registrants (the focus was on social networks and especially facebook). Baccalaureate, Bac+2 and Bachelor's degrees represented 81%. By country, we recorded the existence of 40 nationalities. Although the majority were Moroccan, all four continents - Africa, Europe, Asia and America - were represented.

65% of learners are qualified as **active** since they have opened at least one learning resource (video, activity, quiz, etc.).

The **completion rate** (learners having followed the MOOC from start to finish) was **39%**.

7594 certificates of successful participation were distributed, which means that 39.13% of the active learners completed the MOOC, although they did not necessarily complete it.

7202 learners met the **certification** requirements, which is about 95% of those who completed the programme.

VI. Conclusion And Outlook

The MOOC "General Accounting, Fundamentals" and the MOOC "Accounting for Current Operations" were built in three main phases:

- Design phase during which the teacher scripted and produced the educational content;
- Production phase, which involved two main resources: the computer graphics designer and the audio-visual technician;
- Deployment phase including the work done by the platform engineers to integrate the resources on the EDX platform, the registration of students and the support and assistance in case of technical problems.

The Mooc cannot be successful without the commitment and involvement of all stakeholders throughout the communication and learning phase.

VII. References

[1] TERRY, Anderson , JON, Dron (2011), Three Generations of Distance Education Pedagogy, international Review of Research in Open and Distance Learning, Vol. 12.3

[2] PERAYA, Daniel (2005), La formation à distance: un dispositif de formation et de communication médiatisée. Une approche des processus de médiatisation et de médiation, TICE et développement, N° 1.

[3] Nipper, S. (1989). Third generation distance learning and computer conferencing. In R. Mason & A. Kaye (Eds.), Mindweave: Communication, computers and distance education (pp. 63– 73). Oxford, UK: Permagon

[4] HILLEN, Stefanie, LANDIS, Melodee (2014), Two Perspectives on E-Learning Design: A Synopsis of a U. S. and a European Analysis, international Review of Research in Open and Distance Learning, Vol. 15, N°4

[5] FRANCE, Henri, ANTHONY, Kaye (1985), Enseignement à distance apprentissage autonome? Le savoir à domicile: pedégogie et problématique de la formation a distance, Quebec, Presses de I' Universite du Quebec/Tele-universite.

[6] GERIN-LAJOIE, Serge, PAPI, Cathia, PARADIS, Isabelle (2019), De la formation en présentiel à la formation à distance : Comment s'y retrouver ?

[7] SENER, John (2015). Updated E-Learning Definitions. Retrieved April 16, 2018 from: https://onlinelearningconsortium.org/updated-e-learning-definitions-2/

[8] SMITH Nora (2003), Characteristics of Successful Adult Distance Instructors for Adult Learners, Virginia Community College System, , Volume 8, Number 1

[9] DRISSI, M'hammed, TALBI, Mohammed, KABBAJ, Mohamed (2006). *Distance learning: a complex and complicated system*. HAL-SHS - Sciences de l'Homme et de la Société (archives-ouvertes.fr)

[10] PERRIAULT, Jacques (1996). Distance learning and scientific and technical culture, Alliage, n°29-30.

[11] Classroom Connect (2000), E-Testimony to the Web-based Education Commission. http://www.Webcommission.org/director .

[12] PERRIN, K (2000), The reality of designing and implementing an internet-based course. Journal of Distance Learning Administration, Vol III, No IV.

[13] Cisel, Matthieu (2013), The MOOC revolution. EducProc.fr.

[14] ALEM Noureddine et al (2012), Distance learning platforms in higher education, modes of appropriation and standardisation of uses, frantice.net, issue 5.